Product Update: SmartPlant Design & Visualisation

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HEADLINES …

- Introduction
- Intergraph PP&M - Design & Visualization Products
  - Introduction
  - Positioning
  - Product Strategy
- SmartPlant Spoolgen 2008
- SmartPlant Layout 2008
- SmartPlant 3D 2008
- SmartPlant Review 2008
- PDS 2008
- SmartPlant License Manager 2008
- Q & A
- Summary & Close
Intergraph Asia Pacific 2008
Process Power & Marine
SmartPlant Enterprise
Introduction to Design & Visualisation
Application Portfolio

21-22 August 2008
Hilton Opera Hotel
Hanoi, Vietnam
Intergraph
A Technology Pioneer Spanning over 40 Years

- **Early-1970’s**
  - Powerful 2D/ 3D CAD system connected to database

- **Mid-1980’s**
  - Leading 2D/ 3D plant design system

- **Mid-1990’s**
  - First data management system for plant design industry

- **Early 2000**
  - Next-generation 2D schematics solutions for the plant design industry
  - Leading material management & procurement system

- **Now**
  - Next-generation 3D solutions for plant design, offshore & shipbuilding
  - Continuing R&D investment; $36M in 2007
Process, Power & Marine Integrated, Life Cycle Solutions

Create, capture and maintain engineering data & knowledge throughout a plant's design & operational life cycle
Intergraph Smart Solutions

Breadth and Depth of Applications

Process, Power & Marine

Products
- Conceptual Design
- Detailed Engineering
- Procurement
- Construction
- Start-up / Commissioning
- Operations / Maintenance

• Design
  - SmartPlant Layout
  - SmartPlant 3D/ PDS
  - SmartSketch

• Drafting
  - SmartPlant P&ID
  - SmartPlant Instrumentation

• Intelligent P&ID
  - SmartPlant P&ID
  - SmartPlant Instrumentation

• Instrument Design & Mgmt.
  - SmartPlant Review
  - SmartPlant Materials

• Visualization
  - SP Explorer
  - SP Explorer
  - SmartPlant Review

• Material Mgmt.
  - SmartPlant Materials
  - Directa

• Doc. Mgmt.
  - SP Foundation
  - SP Foundation

• Info. Mgmt.
  - SP Foundation
  - SP Foundation

• Electrical Design
  - SP Electrical
  - SP Electrical

• Process Design
  - Aspen Zygad (Partner)
  - Aspen Zygad (Partner)

• Fabrication
  - SP Isometrics
  - SP Piping
  - Spoolgen

Aspen Zygad (Partner)
3D Modeling & Visualization #1. Process, Power & Marine

**SmartPlant 3D**
- Next generation, data-centric, rule-driven software solution for streamlining engineering design processes while preserving existing data and making it more usable/reusable
- Breaks through the constraints imposed by traditional plant design systems by providing an advanced automation and integration capabilities.

**SmartMarine 3D**
- Next generation, data-centric, rule-driven solution for streamlining shipbuilding design processes
- Proven ship design, production and lifecycle management capabilities within a single integrated environment
- Provides shipbuilders with better decision support capabilities to facilitate global design, production and lifecycle optimization

**SmartPlant Layout**
- Next generation, data-centric solution for preliminary 3D plant layout fully integrated with SmartPlant 3D
- Supports proposal development, early design studies/estimates, design case preparation, & plant layout optimization
- Offers tools for automatic, rule-based pipe routing, layout case management & 3rd party system cost estimation integration

**SmartPlant Review**
- Delivers a visualization environment for reviewing and analyzing large, complex 3D models of process and power plants
- Provides all the visualization tools needed to review designs during engineering, construction or maintenance
- Displays clear presentations that can be easily understood, facilitating project approvals by management and clients
3D Modeling & Visualization #2.

**PDS**
- Plant Design System (PDS) is a comprehensive computer-aided design/engineering (CAD/CAE) application for plant design, construction and operations.
- Has enabled EPC firms and facility owners/operators for more than 20 years to complete projects more efficiently and reduce the total cost of construction and implementation.

**SupportModeler**
- Comprehensive multi-disciplinary hanger & support modeling environment fully integrated with PDS.
- Accelerates the modeling & detailing of both standard and engineered pipe supports.

**SmartPlant Spoolgen**
- Enables fabricators to add manufacturing & construction information to design isometrics (IDFs & PDFs) from Intergraph & other 3rd party plant design systems.
- Automatically generates all necessary pipe spool drawings & reports without the need for redrafting or re-entry of material data.

**SmartPlant Isometrics**
- Design new or modifies existing pipeline or piping system designs.
- Generates piping isometric drawings automatically with ISOGEN.
Intergraph PP&M Product Strategy

- To provide access to **Engineering Data** as a strategic asset & the logical basis for any interoperability platform
- To facilitate **Engineering Data Interoperability & Availability** across the enterprise to deliver real business value for customers throughout the life cycle of their asset
SPOOLGEN 2007  SmartPlant Spoolgen

- **Update for 2008**
  - No major functional changes
  - Some GUI/ layout/ cosmetic changes

- **The Product does what it has to do:**
  - Change routed & designed pipelines
  - Into spools that can be fabricated, transported & erected
  
  *by …*
  - Allowing the right people
  - To input the right information
  - At the right time
Some features ... 

- Workflow database
- The POD (Piping Object Data)
- Part & Weld Number Repeatability
- Replay List
- Fabrication friendly Spools

‘The Digital Isometric Value Chain’
SmartPlant Layout Product Release Strategy now aligned with SmartPlant 3D 2008 release

Growing number of SmartPlant Layout customers since first launch in 2006

2008 Enhancements
- Customer CR's/ TR’s
- Improved SAT 3D Model Handling
- Improves Structural Assembly Handling (Stairs, ladders, handrail, …)

2009 Objectives
- Undertake user workshop during 3Q08 to review current solution, workflows & enhancements to support improved conceptual 3D plant layout & modeling
- Develop user-case stories & product development back-log for 2009

Anyone interested to participate in the SmartPlant Layout workshop email john.sanins@intergraph.com for further details
Process, Power & Marine

Define Site Grid, Plant Zones & Pipe Racks

Create/ Position Equipment

Define / Import Pipe Runs

Auto-Route Pipe Runs

Adjust Layout (Optimization)

Document Design Case

Yes

Layout OK?

No

Yes

①

②

③

④

Workflow/ Overview
Intergraph Asia Pacific 2008
Process Power & Marine
SmartPlant 3D
Release Strategy & Highlights 2008

21-22 August 2008
Hilton Opera Hotel
Hanoi, Vietnam
SmartPlant® 3D Architecture

Process, Power & Marine

Common

3D Interference Detection

Systems & Specifications
Catalogue
Grids
Space Management
Structural
Structural Analysis
Equipment & Furnishings
Piping
Hangers & Supports
Electrical (Cable Tray)
HVAC
Drawings & Reports

Project Setup & Reference Data
Design Aids
Multi-discipline 3D Modeling
Ortho/ISO Drawings & Reports

Structural Drawings
Equipment
Piping
Hangers & Supports
Civils/Arch.
Electrical
HVAC
Based on Six Core Areas today ...

- **Overall Quality, Application Optimization**, Software Performance & Enhancements

- **Automation** @ 2 Levels *(to support Rules, Connectivity and Relationships)*;
  - Generic Task-Based Automation for Designers
  - Strategic High-Level Organizational Automation

- Application **Design & Modeling Productivity** for the Designer
  - Consistent, Multi-Discipline 3D Modeling Environment
  - **Engineering Knowledge Capture** *(‘Rules-based’ Design)*
  - Design Data Reuse

- **Workshare Enabling** - to support global, concurrent engineering

- **Data/ Application Integration** with SmartPlant Enterprise/ Foundation
  - Engineering Change/ Revision Management
  - Workflow-based ‘To-Do’ List

- **3rd Party Application/ Data Integration & Optimization**

- **Continued Quality/ Performance/ Stability Improvement** to support SmartPlant 3D in production

- **Laser Point Cloud Support – Phase I.**

- **3D Modeling Enhancements:**
  - Large Model Data Reuse
  - Tekla – SmartPlant 3D Structural Interface
  - Native Concrete/ Civils Modeling – Phase I.
  - Equipment Modeling Task Enhancements
  - Lisega LICAD support for Hanger & Support Design

- **Customization:**
  - Smart Plant API (.NET based)
    Customization Environment – Phase I.

This SmartPlant 3D Product Release Strategy is designed to communicate a perspective of likely Intergraph R&D prioritization based on the current indicators of client demand. It will change both in scope and timing in response to industry demand which is quite dynamic.

Intergraph retains all decision rights as to what will be included in a particular release, and does not make binding commitments outside of a written commercial contract.

- **External Data Support/ Integration:**
  - XML Import into SmartPlant 3D (via XMpLant) – *Phase I.*
  - Improved support for SAT file import/ referencing
  - Improved support & integration for SmartPlant Reference Data

- **Licensing:**
  - Daily License Key Support

- **Microsoft VISTA Compliance:**
  - Continued .NET customization enhancements
  - Office 2007/ Internet Explorer 2007 Support

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Laser Scanning & Point Clouds – “In-Context 3D Design”

- 3rd Party Supported Laser Scan Point Clouds;
  - Z&F
  - Leica
  - Trimble
  - QuantaPoint
Structural Data Exchange Workflows

**Analysis Data Exchange Workflow**
- SP3D Structure
- Export analysis model
- CIS/2 Analysis Model
- Update member properties
- 3rd party Analysis/Design product (GTSTRUDL, STAAD, SAP2000, EDI, ...)

**Manufacturing Data Exchange Workflow**
- SP3D Structure
- Export physical model
- CIS/2 Physical Model
- Update Connection definition and materials
- 3rd party Detailing product (Tekla, SDS/2, StruCAD...)

**Project Migration Workflow**
- 3rd party modeling products (FWP, Triforma, Tekla, SDS/2, SAC, ...)
- Export physical model
- CIS/2 Physical Model
- New SP3D Structure
SmartPlant Status and Plans:

Tekla Structures (XSTEEL) – SmartPlant 3D Structural Interface
SmartPlant® Status and Plans:

Updated 3D Concrete & Related Solids/ Equipment Modeling

New for 2008 Vision/ Release Strategy

Concrete
What’s new?

- SmartPlant Review Publisher
  - Convert or support Intergraph and non-Intergraph formats for design reviews
    - PDS, SmartPlant, SmartMarine, SmartPlant Spoolgen, laser scanning, PDMS, Microstation, AutoCAD, SAT Format (Solid Edge, Solid Works, Pro/E, Inventor)
  - Converts objects for viewing in SmartPlant Review which allows immediate navigation and design review before the entire project has loaded
  - Combine multiple projects into a single project for viewing in SmartPlant Review
  - Distribute and schedule conversions (includes Batch Services)
What’s new?

- **SmartPlant Review**
  - Manage and display projects from multiple sources by adding and subtract VUE files in the current design review session
  - Review associated label data from multiple projects
  - Improved usability, load and display performance and memory management
  - User can choose the coordinate readout for measurements and any other displayed coordinates
  - No longer reads DWG, DXF, SAT files for viewing (use SPR Publisher)
  - Ability to use SPR as the SmartPlant Foundation view control including correlation to other documents and information
  - View SP3D aspects (with on/off capability)
  - Support latest Windows Operating Systems (Vista SP1 and WinXP SP3)
  - Supports Citrix v4
Manage & display multiple sources
Converted with SPR Publisher

PDS
SmartPlant 3D
SmartMarine 3D
PDMS
AutoCAD 2D or 3D

Laser Scanning

Microstation v8 2D or 3D

Spoolgen PCF/IDF

SolidEdge Inventor
SmartPlant®
Review
The enterprise viewing solution
Combine into a single design review
Asset Management View Control

The enterprise viewing solution

SmartPlant Review
The enterprise viewing solution
Benefits

- Ensure effective communication for the entire project team
  - Everyone has the most recent 3D views of the project
- Reduce confusion by standardizing on a single 3D viewer
  - Perform 3D design reviews of all the major 3D plant model formats
- Less waiting during design reviews
  - Use object streaming to start navigating before the entire project has loaded
- Improve 3D model reviews for asset management
  - Make full use of SmartPlant Review’s advanced capabilities inside SmartPlant Foundation
- See project changes earlier
  - Combine and compare two separate publishes of the same project
Visualization Focus Group Initiation

- **What:** Visualization Focus Group Meeting
- **When:** Thursday, June 5
- **Time:** 10:00 am – 10:45 am (PDT)
- **Where:** Genoa meeting room

- **Who should attend?**
  - Anyone who wants to become part of future PPM visualization software development teams to provide technical subject matter input for the chosen area of development (for example, usability, publishing, and performance)
  - Provide a validation point for workflows used as part of the development process
  - Provide an engineering, construction or operations industry / end-user validation point for newly developed software to ensure 3D visualization needs are met ‘fit-for-purpose’
  - Provide and participate in application usability workshops and clinics to confirm usability and the ‘ergonomics’ and related streamlining of supported plant design workflows
What’s new?

- **Enhancements**
  - **ISOGEN (PD_ISO)**
    - Increase commodity code length to 36 char
  - Ability to Integrate with Line list from SmartPlant Material (wall thickness)
  - **Pipe Design Graphics (PD_DESIGN)**
    - Ability to sort the reference model attachment
    - Display ‘Read Only’ status
  - **Project Administrator (PD_PROJECT)**
    - User defined attributes for EQP provide a code list lookup
    - Improved incremental archive to validate and update the FWP prp file date
  - **File Lock Manager**
    - Enhanced to show the locked models, drawings, etc. even when the user does not have privileges to unlock them.
PDS 2008 SmartPlant Enabled

Enhancements

- **PD_SHELL**
  - Added Batch mode / command line key-in for verify model command
  - Use BatchServices Scheduling feature for PDS scheduled jobs
  - Upgrade utility for converting AT jobs to Batch Services
  - Extended commodity code length to 36 characters (Upgrades database automatically)

- **PD_XPDA**
  - Copy/Move/Delete multiple models (Drag & Drop)
  - Export to Excel includes Store Model Status

- **Support Modeler**
  - Code listed values written as short back to Pdtable_80
  - FINL library included
  - HILTI library included
  - Increased max length of Bill of Material for drawing is now 255 characters
  - Ability to delete all the supports in a model
PDS 2008 SmartPlant Enabled

- **Enhancements**
  - FrameWorks Plus
    - New option to also copy overrides with copying members
  - CIS export now includes grids, tapered members, arc members, and user arbitrary sections
  - Updated AISC section table to 13th edition
    - Includes latest China section tables
  - EE Raceway
    - Raceway elements can be copied from a referenced model into the active model using any of the copy commands
  - Interference Checker/ Manager (PD_CLASH)
    - improved error log file
    - improved envelope processing ignoring warnings
  - User Reference Database (RD_USRDB)
    - Delivered new short and long material description library
PDS 2008 SmartPlant Enabled

Release Summary & Benefits

- Increases PDS design efficiency
  - Provides targeted enhancements for existing users in production
  - Focused on compatibility and quality
    - Over 280 TR’s fixed, and consolidated Hot Fixes
- Provides a stable platform for new & existing projects
  - Certified with the latest operating systems and service packs
    - Windows XP SP3, Windows Vista SP1
    - Oracle 10.2.0.4
    - Oracle 64 bit
    - Citrix 4.0
    - 64 bit Server
    - Support SPE 2008
    - Vista support for Batch Services
    - Vista support for online help and documentation

Scheduled to ship in July 2008
What’s new?

- Additional products supported
  - SmartPlant Materials 2008
  - SmartPlant Reference Data 2008
  - SmartPlant Isometrics 2008
  - SmartPlant Spoolgen 2008
  - SmartPlant Review Publisher 2008
- Additional enhancements
  - Supports SPE 2008 including support for Vista SP1 and XP SP3.
  - Internationalization
  - Provides “Username” tracking for reporting
  - Provides multi-SPLM licensing machine support for Citrix end users
  - New reporting capabilities
- Upgrade from SPLM 2007 to SPLM 2008 without loss of production
- SPLM 2008 supports previous versions of the applications
- All version 2008 concurrent licensed products require SPLM 2008
- Upgrading to any version 2008 product requires all client machines with the 2008 products installed to be upgraded to SPLM 2008
SmartPlant License Manager 2008

Enhanced reporting capabilities

License Key SPLM 1*
Journal File
Copy of journal (encrypted)

License Key SPLM 2*
Journal File
Copy of journal (encrypted)

License Key SPLM 3*
Journal File
Archive Files
Copy of journal (encrypted)

SP3D
SP Layout
SM3D
PDS
FWP
SPR
SPR Pub
SPI
SPEL
SP PID
SPMAT
SPRD
SP Spoolgen
SP Isometrics
SSK

*SPLM License Machines

eLicense key cutter

License Usage Reports

License Usage

License Usage

License Usage
### SmartPlant License Manager 2008 Reporting Utility

#### Process, Power & Marine

![Image of SmartPlant License Manager 2008 Reporting Utility](image)

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#### Additional Features

- PivotTable Tools
- JournalFilesDB: Database (Access 2007) - Microsoft Access
- Reporting Utility for easy data visualization and analysis.
Benefits

- Manage more SmartPlant applications in a single licensing system
- Use the latest operating systems (MS Vista or XP)
- Improved reporting eliminates the need to extract transaction data from the log file
- Improved reporting provides:
  - Secure transfer of transaction data
  - Ability to combine and analyze license usage from multiple license machines
  - Use default reports or create custom reports (via MS Access)
    - Report license usage by hours, by application per day, week, or month
    - Report license usage by hours, by user per day, week, or month
    - Report peak license usage per day, week, or month
    - Report extended and non-extended license usage (12 hr vs. 24 hr)
    - Report batch and interactive license usage
Intergraph continues major R&D investment across all SmartPlant Design & Visualization products as part of its Smart Solutions portfolio.

SmartPlant 3D product developments & enhancements continue to extend current plant design capabilities to new levels in 2008 supporting the growing number of customers now moving into full production.

Intergraph’s data & application integration strategy supporting key plant design workflows continues to evolve & be a major focus for 2008.

The journey continues...